

E-Cigarette Aerosol Analysis Report

Report No. : TCT181015C020

Date : Oct. 23, 2018

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Applicant: Vandy Vape**Address:** 415, huafeng Internet + creative park, no.107 republic industrial road,
xixiang, baoan district, shenzhen**The following sample was submitted and identified by/on behalf of the client as:**

Sample Name: Widowmaker RDA

Model No.: Widowmaker RDA

Tank: 1ml

Power level in testing: 40 W

Adjustable air inlet or not: Yes

Trade Mark: Vandy Vape

Sample Received Date: 2018.10.15

Testing Period: 2018.10.15—2018.10.23

Test Method: Please refer to the following page(s).

Test Result(s): Please refer to the following page(s).

| Test Items | Test Requested |
|---|-------------------------------|
| 1 Carbonyl Compounds: Formaldehyde, Acetaldehyde, Acrolein, Crotonaldehyde | Emission testing according to |
| 2 Metals: Aluminum, Chromium, Iron, Nickel, Tin, Lead, Cadmium, Arsenic, Antimony | Article 20 of Tobacco Product |
| 3 Nicotine consistency | Directive (2014/40/EU) |

Checked by



Noel Yin

Signed for and on behalf of TCT

Kim Zhang
Technical Manager

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Test Results:

Test Condition for test items except Nicotine consistency test:

With reference to the CORESTA RECOMMENDED METHOD N° 81 method parameter and Afnor standardization XP D90-300-3, a smoke machine was used to collect the vapor.

| | |
|--------------------------------|------------------|
| Puff Duration | 3.0s±0.1s |
| Puff Volume | 55mL±0.3mL |
| Puff Frequency | 30s±0.5s |
| Puff of Each Group | 20 |
| Group Interval Time | 300s±120s |
| Maximum Flow | 18.5mL/s±1.0mL/s |
| Pressure Drop | < 50hPa |
| Group | 5 |
| Total Number of Puff | 100 |
| Total Duration of Vaporization | 300s |

The temperature and relative humidity of the test atmosphere during machine preparation and testing were kept within the following limits: temperature $\pm 2^{\circ}\text{C}$, relative humidity $\pm 5\%$

Sample Description:

No.1 Widowmaker RDA

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1. Carbonyl Compounds Content(s)

Method: The volatile aldehydes are extracted from the aerosol by bubbling each puff through an impactor containing an acidified aqueous solution of 2,4-DNPH. The samples are analyzed by reverse phase high-performance liquid chromatography and determined using a UV detector.

| Test Item | CAS No. | Unit | MDL | LOQ | Content(s) |
|----------------|-----------|-------------|-------|-----|------------|
| | | | | | No.1 |
| Formaldehyde | 50-00-0 | ug/100puffs | 0.667 | 2 | 27.7 |
| Acetaldehyde | 75-07-0 | ug/100puffs | 0.667 | 2 | 15.8 |
| Acrolein | 107-02-8 | ug/100puffs | 0.667 | 2 | ND |
| Crotonaldehyde | 4170-30-3 | ug/100puffs | 0.667 | 2 | ND |

- Note:
- ug = Microgram
 - ND = Not Detected (lower than MDL)
 - MDL = Method Detection Limit
 - LOQ = Limit of Quantitation
 - E-Liquid Used: E-liquid B (AFNOR XP D90-300-3)

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2. Metals Content(s)

Method: The vapor was passed through a dry-ice cooled impinger containing glass packing beads and quartz wool. After smoking the impinger was extracted with 5% nitric acid and filtered through quartz wool. An aliquot of the resulting solution was submitted for analysis by ICP-OES.

| Test Item | CAS No. | Unit | MDL | LOQ | Content(s) |
|--------------|-----------|-------------|-------|------|------------|
| | | | | | No.1 |
| Aluminum(Al) | 7429-90-5 | ug/100puffs | 0.025 | 0.25 | ND |
| Chromium(Cr) | 7440-47-3 | ug/100puffs | 0.005 | 0.05 | ND |
| Iron(Fe) | 7439-89-6 | ug/100puffs | 0.005 | 0.05 | ND |
| Nickel(Ni) | 7440-02-0 | ug/100puffs | 0.025 | 0.25 | ND |
| Tin(Sn) | 7440-31-5 | ug/100puffs | 0.25 | 2.5 | ND |
| Lead(Pb) | 7439-92-1 | ug/100puffs | 0.025 | 0.25 | ND |
| Cadmium(Cd) | 7440-43-9 | ug/100puffs | 0.005 | 0.05 | ND |
| Arsenic(As) | 7440-38-2 | ug/100puffs | 0.025 | 0.25 | ND |
| Antimony(Sb) | 7440-36-0 | ug/100puffs | 0.025 | 0.25 | ND |

- Note:
- ug = Microgram
 - ND = Not Detected (lower than MDL)
 - MDL = Method Detection Limit
 - LOQ = Limit of Quantitation
 - E-Liquid Used: E-liquid B (AFNOR XP D90-300-3)

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3. Nicotine Consistency Test

Test Condition: With reference to the CORESTA RECOMMENDED METHOD N° 81 method parameter and Afnor standardization XP D90-300-3, a smoke machine was used to collect the vapor.

| | |
|--------------------|------------------|
| Puff Duration | 3.0s±0.1s |
| Puff Volume | 55mL±0.3mL |
| Puff of Each Group | 20 |
| Maximum Flow | 18.5mL/s±1.0mL/s |
| Pressure Drop | < 50hPa |

The temperature and relative humidity of the test atmosphere during machine preparation and testing were kept within the following limits: temperature $\pm 2^{\circ}\text{C}$, relative humidity $\pm 5\%$

Method: A reference liquid was prepared. A pharmaceutical nicotine inhaler was used as a comparator. Products were attached to a smoke machine, and the aerosol was collected in Cambridge filter pads. After trapping and solvent extraction, solution was analyzed by GC-MS and nicotine was dosed by comparing the areas obtained on the MS detector with those of standard solutions prepared in the laboratory under concentration conditions surrounding those of the samples.

| Sample No. | Nicotine(CAS No.:54-11-5) Contents(mg/20Puffs) | | | | | | Total (mg/100puffs) |
|--------------|--|---------|----------|---------|----------|------|------------------------|
| | Group 1* | Group 2 | Group 3* | Group 4 | Group 5* | AVG | |
| No.1 | 2.73 | 2.72 | 2.70 | 2.67 | 2.73 | 2.71 | 13.6 |
| Deviation(%) | 0.6 | | 0.2 | | 0.8 | | |

- Note:
- mg = milligram
 - ND = Not Detected (lower than MDL)
 - MDL = Method Detection Limit = 0.01mg/20Puffs
 - LOQ = Limit of Quantitation = 0.1mg/20Puffs
 - 1group = 20puffs
 - * Values used for determination of consistency of nicotine emission
 - E-Liquid Used: E-liquid A (AFNOR XP D90-300-3)
 - Under the conditions of the test and with reference to AFNOR XP D90-300-3, the electronic cigarette delivers a dose of nicotine at consistent levels.

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Photo(s) of the sample(s)



Widowmaker RDA

***** End of Report *****

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